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 L. Herbert Ballou University Professor of Neuroscience
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EDUCATION:

University of Dayton	B.S.	Biology	1971-74
Duke University	Ph.D.	Physiology & Pharmacology (mentor: George G. Somjen)	1975-79
Stanford University	Postdoctoral fellow	Neuroscience (mentors: David A. Prince, Stephen G. Waxman)	1979-82

ACADEMIC APPOINTMENTS:

1982-87	Assistant Professor	Dept. of Neurology	Stanford University
1987-89	Assistant Professor	Section of Neurobiology	Brown University
1989-94	Associate Professor	Dept. of Neuroscience	Brown University
1994-present	Professor	Dept. of Neuroscience	Brown University
2000-present	L. Herbert Ballou University Professor		Brown University
2006-16	Department Chair	Dept. of Neuroscience	Brown University

FELLOWSHIPS AND HONORS:

1975-79	NIH predoctoral fellowship
1979-81	NIH postdoctoral fellowship
1981-82	Lennox Postdoctoral Fellowship, American Epilepsy Society
1985-88	Klingenstein Fellowship in the Neurosciences
1985-91	Research Career Development Award, NIH
1989	Master of Arts, <i>ad eundem</i> , Brown University
1992	Grass Foundation Traveling Scientist
1997	Dozor Visiting Professor, Ben-Gurion University, Israel
1997-04	Javits Neuroscience Investigator Award, NIH, NINDS
2001	Keynote speaker, "Neuroscience at Storrs", University of Connecticut
2004	Special Lecturer, Society for Neuroscience Annual Meeting
2000-present	L. Herbert Ballou University Professor of Neuroscience
2000-07	Associate, Neurosciences Research Program (NRP), La Jolla, CA
2004-08	Dean's Teaching Excellence Award, Alpert Medical School, Brown
2009	Plenary Lecturer, Japan Neuroscience Society, Nagoya
2009	Keynote Speaker, International Gap Junction Conference, Sedona AZ
2009-14	Certificate for Exemplary Teaching, Alpert Medical School, Brown
2011	Herbert Jasper Lecturer, Montreal Neurological Institute, McGill University
2012	Neurosciences Institute Distinguished Lecturer, University of Texas, San Antonio
2012	Fellow of the American Association for the Advancement of Science (AAAS)
2017	Dominick Purpura Distinguished Neuroscientist Lecture, Einstein College of Medicine

EDITORIAL BOARDS:

- 1996-2000 *Journal of Neuroscience*, Associate Editor
2000-03 *Journal of Neuroscience*, Reviewing Editor
2003-06 *Journal of Neuroscience*, Senior Editor
2001-08 *Thalamus and Related Systems*, Editorial Board
2008-12 *Frontiers in Cellular Neuroscience*, Associate Editor
2009-14 *Epilepsy Currents*, Contributing Editor
1999-2014 *Journal of Neurophysiology*, Editorial Board
1996-present *Cerebral Cortex*, Associate Editor
2006-present *Brain Structure and Function*, Editorial Board

SERVICE COMMITTEES (recent):

- 1998-2002 NIH study section, IFCN-8, regular member
2008-11 NIH study section, NST-2; K99/R00 Pathway to Independence Awards, regular member
2010 Blueprint Undergraduate Research Diversity (R25) Applications, NIMH, ad hoc reviewer
2010 External reviewer, Neuroscience Graduate Program, Harvard University
2011 External advisory board, Center for Neural Basis of Cognition, Carnegie-Mellon & U Pitt
2012 NIH special emphasis panel, ZRG1 IFCN-Q, ad hoc reviewer
2013 NIH study section, ZMH1 ERB-S, ad hoc reviewer
2013 NIH special emphasis panel, ZRG1 IFCN-T, ad hoc reviewer
2010-13 Committee on Neuroscience Depts and Programs (Soc for Neuroscience), member
2014 NIH study section, ZMH1 ERB-S, 04, ad hoc reviewer
2014 NIMH Board Scientific Counselors, ad hoc reviewer
2015 NIH study section (ZMH1 ERB-S), ad hoc reviewer
2015 NIH study section (ZRG1 IFCN-T-02), ad hoc reviewer
2016 NINDS Special Emphasis Panel (ZNS1 SRB-E 07), R35 reviewing, ad hoc reviewer
2016 NIMH Special Emphasis Panel (ZMH1 ERB-X 01), R25 reviewing, ad hoc reviewer
2017 NIH Neurotransporters, Receptors, Calcium study section, ad hoc reviewer
2017 NIH Director's Early Independence Award (DP5) ad hoc reviewer
2017 Co-organizer (with A Pereda, M Feller, N Spruston), *Electrical Synapses* conference, Janelia Research Campus, HHMI
2018-22 NIH, Sensorimotor Integration Study Section, regular member

PRIMARY JOURNAL ARTICLES:

(links to my publications are available here: <https://scholar.google.com/citations?user=whbW9AQAAA>)

Connors B, Dray A, Fox P, Hilmy M, Somjen G. LSD's effect on neuron population in visual cortex gauged by transient responses of extracellular potassium evoked by optical stimuli. *Neurosci Lett*, 13: 147-150, 1979.

Kinnes CG, Connors BW, Somjen GG. The effects of convulsant doses of penicillin on primary afferents, dorsal root ganglion cells and on "presynaptic" inhibition in the spinal cord. *Brain Res*, 192: 495-512, 1980.

Connors BW. A comparison of the effects of pentobarbital and diphenylhydantoin on the GABA sensitivity and excitability of adult sensory ganglion cells. *Brain Res*, 207: 357-369, 1981.

Gutnick MJ, Connors BW, Ransom BR. Dye-coupling between glial cells in the guinea pig neocortical slice. *Brain Res*, 213: 486-492, 1981.

Kocsis JD, Malenka RC, Connors BW, Waxman SG, Cummins KL. Population response characteristics of fiber tracts in central white matter. *Prog Clin Biol Res*. 52: 17-32, 1981.

Foster RE, Connors BW, Waxman SG. Rat optic nerve: Electrophysiological, pharmacological and anatomical studies during development. *Develop Brain Res*, 3: 371-386, 1982.

Connors BW, Prince DA. Effects of the local anesthetic QX-314 on the membrane properties of hippocampal pyramidal neurons. *J Pharmacol Exp Therap*, 220: 476-481, 1982.

Connors BW, Ransom BR, Kunis D, Gutnick MJ. Activity-dependent K⁺ accumulation in the developing rat optic nerve. *Science*, 216: 1341-1343, 1982.

Connors BW, Gutnick MJ, Prince DA. Electrophysiological properties of neocortical neurons *in vitro*. *J Neurophysiol*, 48: 1302-1320, 1982.

Gutnick MJ, Connors BW, Prince DA. Mechanisms of neocortical epileptogenesis *in vitro*. *J Neurophysiol*, 48: 1321-1335, 1982.

Connors BW, Benardo LS, Prince DA. Coupling between neurons of the developing rat neocortex. *J Neurosci*, 3: 773-782, 1983.

Connors BW, Benardo LS, Prince DA. Carbon dioxide sensitivity of dye-coupling among glia and neurons of the neocortex. *J Neurosci*, 4: 1324-1330, 1984.

Connors BW. Initiation of synchronized neuronal bursting in neocortex. *Nature*, 310: 685-687, 1984.

Connors BW, Ransom BR. Chloride conductance and extracellular potassium concentration interact to modify the excitability of rat optic nerve fibres. *J Physiol (Lond)*, 355: 619-633, 1984.

Ransom BR, Yamate CL, Connors BW. Activity-dependent shrinkage of extracellular space: A developmental study. *J Neurosci*, 5: 532-535, 1985.

McCormick DA, Connors BW, Lighthall JW, Prince DA. Comparative electrophysiology of pyramidal and sparsely spiny neurons of the neocortex. *J Neurophysiol*, 54: 782-806, 1985. (*Journal of Neurophysiology* Classic Article)

Connors BW, Kriegstein AR. Cellular physiology of the turtle visual cortex: Distinctive properties of pyramidal and stellate neurons. *J Neurosci*, 6: 164-177, 1986.

Kriegstein AR, Connors BW. Cellular physiology of the turtle visual cortex: Synaptic properties and intrinsic circuitry. *J Neurosci*, 6: 178-191, 1986.

Connors BW, Ransom BR. Electrophysiological properties of ependymal cells (radial glia) in dorsal cortex of the turtle, *Pseudmys scripta*. *J Physiol (Lond)* 385: 287-306, 1987.

Chervin RD, Pierce PA, Connors BW. Periodicity and directionality in the propagation of epileptiform discharges across neocortex. *J Neurophysiol*, 60: 1695-1713, 1988.

Connors BW, Malenka RC, Silva LR. Two inhibitory postsynaptic potentials, and GABA_A and GABA_B receptor-mediated responses in neocortex of rat and cat. *J Physiol (Lond)*, 406: 443-468, 1988.

Chagnac-Amitai Y, Connors BW. Horizontal spread of synchronized activity in neocortex, and its control by GABA-mediated inhibition. *J Neurophysiol*, 61: 747-757, 1989.

Agmon, A., Connors BW. Repetitive burst-firing neurons in the deep layers of mouse somatosensory cortex. *Neurosci Lett*, 99: 137-141, 1989.

Chagnac-Amitai Y, Connors BW. Synchronized excitation and inhibition driven by intrinsically bursting neurons in neocortex. *J Neurophysiol*, 62: 1149-1162, 1989.

Silva LR, Amitai Y, Connors BW. Intrinsic oscillations of neocortex generated by layer 5 pyramidal neurons. *Science*, 251: 432-435, 1991.

Agmon A, Connors BW. Thalamocortical responses of mouse somatosensory (barrel) cortex *in vitro*. *Neuroscience*, 41: 365-380, 1991.

Silva LR, Gutnick MJ, Connors BW. Laminar distribution of neuronal membrane properties in neocortex of normal and reeler mouse. *J Neurophysiol*, 66: 2034-2040, 1991.

Agmon A, Connors BW. Correlation between intrinsic firing patterns and thalamocortical responses of mouse barrel cortex neurons. *J Neurosci*, 12: 319-330, 1992.

Bear MF, Press WA, Connors BW. Long-term potentiation in slices of kitten visual cortex and the effects of NMDA receptor blockade. *J Neurophysiol*, 67: 841-851, 1992.

Amitai Y, Friedman A, Connors BW, Gutnick MJ. Regenerative activity in the apical dendrites of pyramidal cells in neocortex. *Cerebral Cortex*, 3: 26-38, 1993.

Kim HG, Connors BW. Apical dendrites of the neocortex: correlation between sodium- and calcium-dependent spiking and pyramidal cell morphology. *J Neurosci*, 13: 5301-5311, 1993.

Cauler LJ, Connors BW. Synaptic physiology of horizontal afferents to layer I of primary somatosensory cortex in rats. *J Neurosci*, 14: 751-762, 1994.

Kim HG, Fox K, Connors BW. Properties of excitatory synaptic events in neurons of the primary somatosensory cortex of neonatal rats. *Cerebral Cortex*, 2:148-157, 1995.

Castro-Alamancos MA, Donoghue JP, Connors BW. Different forms of synaptic plasticity in somatosensory and motor areas of the neocortex. *J Neurosci*, 15: 5324-5333, 1995.

Kim HG, Beierlein M, Connors BW. Inhibitory control of excitable dendrites in neocortex, *J Neurophysiol*, 74: 1810-1814, 1995.

Castro-Alamancos MA, Connors BW. Short-term synaptic enhancement and long-term potentiation in neocortex. *Proc Natl Acad Sci USA*, 93: 1335-1339, 1996a.

Castro-Alamancos MA, Connors BW. Short-term plasticity of a thalamocortical pathway dynamically modulated by behavioral state. *Science*, 272: 274-277, 1996b.

Flint AC, Connors BW. Two types of network oscillations in neocortex mediated by distinct glutamate receptor subtypes and neuronal populations. *J Neurophysiol*, 75: 951-956, 1996.

Castro-Alamancos MA, Connors BW. Spatiotemporal properties of short-term plasticity in sensorimotor thalamocortical pathways of the rat. *J Neurosci*, 16: 2767-2779, 1996c.

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Gil Z, Connors BW, Amitai Y. Differential regulation of neocortical synapses by activity and neuromodulators. *Neuron*, 19: 679-686, 1997.

Cauler LJ, Clancy B, Connors BW. Backward cortical projections to primary somatosensory cortex in rats extend long horizontal axons in layer I. *J Comp Neurol*, 390: 297-310, 1998.

Telfeian AE, Connors BW. Layer-specific pathways for the horizontal propagation of epileptiform discharges in neocortex. *Epilepsia*, 39: 700-708, 1998.

Zhu JJ, Connors BW. Intrinsic firing patterns and whisker-evoked synaptic responses of neurons in the rat barrel cortex. *J Neurophysiol*, 81: 1171-1183, 1999.

Gil Z, Connors BW, Amitai Y. Efficacy of thalamocortical and intracortical synaptic connections: quanta, innervation, and reliability. *Neuron*, 23: 385-397, 1999.

Finnerty GT, Roberts LS, Connors BW. Sensory experience modifies short-term dynamics of neocortical synapses. *Nature*, 400: 367-371, 1999.

Telfeian AE, Connors BW. Epileptiform propagation patterns mediated by NMDA and nonNMDA receptors in neocortex. *Epilepsia*, 40: 1580-1586, 1999.

Gibson JR, Beierlein M, Connors BW. Two networks of electrically coupled inhibitory neurons in neocortex. *Nature*, 402: 75-79, 1999.

Beierlein M, Gibson JR, Connors BW. An electrically coupled network of interneurons drives synchronized inhibition in neocortex. *Nature Neurosci*, 3: 904-910, 2000.

Finnerty GT, Connors BW. Modest alterations of short-term synaptic dynamics follow sensory deprivation without competition. *Proc Natl Acad Sci USA*, 97: 12864-12868, 2000.

Deans MR, Gibson JR, Sellitto C, Connors BW, Paul DL. Synchronous activity of inhibitory networks in neocortex requires electrical synapses containing connexin36. *Neuron*, 31: 477-485, 2001.

Landisman CE, Long MA, Beierlein M, Deans MR, Paul DL, Connors BW. Electrical synapses in the thalamic reticular nucleus. *J Neurosci*, 22: 1002-1009, 2002.

Amitai Y, Gibson JR, Beierlein M, Patrick SL, Ho AM, Connors BW, Golomb D. The spatial dimensions of electrically coupled networks of interneurons in neocortex. *J Neurosci*, 22: 4142-4152, 2002.

Beierlein M, Connors BW. Efficacy and dynamics of excitatory synapses to layer 6 neurons in neocortex depend on input source. *J Neurophysiol*, 88: 1924-1932, 2002.

Long MA, Deans MR, Paul DL, Connors BW. Rhythmicity without synchrony in the electrically uncoupled inferior olive. *J Neurosci*, 22: 10898-10905, 2002.

Telfeian AE, Connors BW. Widely integrative properties of layer 5 pyramidal cells support a role for processing of extralaminar synaptic inputs in rat neocortex. *Neurosci Lett*, 343: 121-124, 2003.

Beierlein M, Gibson JR, Connors BW. Two dynamically distinct inhibitory networks in layer 4 of the neocortex. *J Neurophysiol*, 90: 2987-3000, 2003.

Long MA, Landisman CE, Connors BW. Small clusters of electrically coupled neurons generate synchronous rhythms in the thalamic reticular nucleus. *J Neurosci*, 24: 341-349, 2004.

Cruikshank SJ, Hopperstad M, Younger M, Connors BW, Spray DC, Srinivas M. Potent block of Cx36 and Cx50 gap junction channels by mefloquine. *Proc Natl Acad Sci, USA*, 101: 12364-12369, 2004.

Patterson WR, Song Y-K, Bull CW, Ozden I, Deangelis A, McKay JL, Nurmikko AV, Donoghue JD, Connors BW. A microelectrode/microelectronic hybrid device for brain implantable neuroprosthesis applications. *IEEE Trans Biomed Engin*, 10: 1845-1853, 2004.

Ozden I, Venkataramani S, Long MA, Connors BW, Nurmikko AV. Strong coupling of nonlinear electronic and biological oscillators: Reaching the "amplitude death" regime. *Physical Rev Lett*, 93: 158102-1-4, 2004.

Gibson JR, Beierlein M, Connors BW. Functional properties of electrical synapses between inhibitory interneurons of neocortical layer 4. *J Neurophysiol*, 93: 467-480, 2005.

Song YK, Patterson WR, Bull CW, Beals J, Hwang NJ, Deangelis AP, Lay C, McKay JL, Nurmikko AV, Fellows MR, Simeral J, Donoghue JP, Connors BW. Development of a chipscale integrated microelectrode / microelectronic device for brain implantable neuroengineering applications. *IEEE Trans Neural Systems Rehab Engin*, 13: 220-226, 2005.

Long MA, Cruikshank SJ, Jutras MJ, Connors BW. Abrupt maturation of a spike-synchronizing mechanism in neocortex. *J Neurosci*, 25: 7309-7316, 2005.

Long MA, Jutras MJ, Connors BW, Burwell RD. Electrical synapses coordinate activity in the suprachiasmatic nucleus. *Nature Neurosci*, 8: 61-66, 2005.

Pinto DJ, Patrick SL, Huang WC, Connors BW. Initiation, propagation, and termination of epileptiform activity in neocortex in vitro involve distinct mechanisms. *J Neurosci*, 25: 8131-8140, 2005.

Venkataramani S, Davitt KM, Zhang J, Xu H, Song YK, Connors BW, Nurmikko AV. Compact semiconductor light-emitting diodes for dynamical imaging of neuronal circuitry. *IEEE J Select Topics Quantum Electron*, 11: 785-790, 2005.

Landisman CE, Connors BW. Modulation of electrical synapses in the mammalian thalamus. *Science*, 310:1809-1813, 2005.

Patrick SL, Connors BW, Landisman CE. Developmental changes in somatostatin-positive interneurons in a freeze-lesion model of epilepsy. *Epilepsy Res*, 70: 161-171, 2006.

Venkataramani S, Davitt KM, Zhang J, Xu H, Song YK, Connors BW, Nurmikko AV. Semiconductor ultra-violet light emitting diodes for flash photolysis. *J Neurosci Meth*, 160:5-9, 2007.

Mancilla JG, Lewis TJ, Pinto DJ, Rinzel J, Connors BW. Synchronization of electrically coupled pairs of inhibitory interneurons in neocortex. *J Neurosci*, 27:2058-2073, 2007.

Cruikshank SJ, Lewis TJ, Connors BW. Synaptic basis for intense thalamocortical activation of feedforward inhibitory cells in neocortex. *Nature Neurosci*, 10: 462-468, 2007.

Landisman CE, Connors BW. VPM and PoM nuclei of the rat somatosensory thalamus: intrinsic neuronal properties and corticothalamic feedback. *Cerebral Cortex*, 17:2853-2865, 2007.

Fanselow EE, Richardson KA, Connors BW. Selective, state-dependent activation of somatostatin-expressing inhibitory interneurons in mouse neocortex. *J Neurophysiol*, 100: 2640-2652, 2008.

Zhang J, Laiwalla F, Kim JA, Urabe H, Wagenen Van R, Song Y-K, Connors BW, Zhang F, Deisseroth K, Nurmikko AV. Integrated device for optical stimulation and spatiotemporal electrical recording of neural activity in light sensitized brain tissue. *J Neural Engin*, 6: 55007, 2009.

Parker PRL, Cruikshank SJ, and Connors BW. Stability of electrical coupling despite massive developmental changes of intrinsic neuronal physiology. *J Neurosci*, 29: 9761–9770, 2009.

Zhang J, Laiwalla F, Kim JA, Urabe H, Van Wagenen R, Song YK, Connors BW, Nurmikko AV. A microelectrode array incorporating an optical waveguide device for stimulation and spatiotemporal electrical recording of neural activity. *Conf Proc IEEE Eng Med Biol Soc*. 1: 2046-2049, 2009.

Cruikshank SJ, Urabe H, Nurmikko AV, Connors BW. Pathway-specific feedforward circuits between thalamus and neocortex revealed by selective optical stimulation of axons. *Neuron*, 65: 230–245, 2010.

Lee S-C, Cruikshank SJ, Connors BW. Electrical and chemical synapses between relay neurons in developing thalamus. *J Physiol (London)*. 588: 2403–2415, 2010.

Fanselow EE, Connors BW. The role of somatostatin-expressing (GIN) and fast-spiking interneurons in UP-DOWN states of mouse neocortex. *J Neurophysiol*. 104: 596–606, 2010.

Hayut I, Fanselow EE, Connors BW, Golomb D. LTS and FS inhibitory interneurons, short-term synaptic plasticity, and cortical circuit dynamics. *PLoS Comput Biol*. 7(10): e1002248, 2011.

Sills JB, Connors BW, Burwell RD. Electrophysiological and morphological properties of neurons in layer 5 of the rat poststrinal cortex. *Hippocampus*, 22: 1912-1922, 2012.

Kim JA, Connors BW. High temperatures alter physiological properties of pyramidal cells and inhibitory interneurons in hippocampus. *Frontiers Cell Neurosci*, 6: 27, 2012.

Cruikshank SJ, Ahmed OJ, Stevens TR, Patrick SL, Gonzalez AN, Elmaleh M, Connors BW. Thalamic control of layer 1 circuits in prefrontal cortex. *J Neurosci*, 32: 17813-17823, 2012.

Normand ER, Crandall SR, Thorne CA, Murphy EM, Voelcker B, Browning C, Machan JT, Moore CI, Connors BW, Zervas M. Temporal and mosaic Tsc1 deletion in the developing thalamus disrupts thalamocortical circuitry, neural function, and behavior. *Neuron*, 78: 895–909, 2013.

Lee S-C, Patrick SL, Richardson KA, Connors BW. Two functionally distinct networks of gap junction-coupled inhibitory neurons in the thalamic reticular nucleus. *J Neurosci*, 34:13170-13182, 2014.

Neske GT, Patrick SL, Connors BW. Contributions of diverse excitatory and inhibitory neurons to recurrent network activity in cerebral cortex. *J Neurosci*, 35:1089-1105, 2015.

Crandall SR, Cruikshank SJ, Connors, BW. A corticothalamic switch: controlling the thalamus with dynamic synapses. *Neuron*, 86:768–782, 2015.

Ho JW, Poeta DL, Jacobson TK, Zolnik TA, Neske GT, Connors BW, Burwell RD. Bidirectional Modulation of Recognition Memory. *J Neurosci*, 35:13323-13335, 2015.

Zolnik TA, Connors BW. Electrical synapses and the development of inhibitory circuits in the thalamus. *J Physiol (London)*, 594:2579-2592, 2016.

Neske GT, Connors BW. Distinct roles of SOM and VIP interneurons during cortical Up states. *Frontiers Neural Circuits*, 10:52. DOI: 10.3389/fncir.2016.00052, 2016.

Neske GT, Connors BW. Synchronized gamma-frequency inhibition in neocortex depends on excitatory-inhibitory interactions but not electrical synapses. *J Neurophysiol*, 116:351-368, 2016.

Blaeser AS, Connors BW, Nurmikko AV. Spontaneous dynamics of neural networks in deep layers of prefrontal cortex. *J Neurophysiol*, 117:1581-1594, 2017.

Crandall SR, Patrick SL, Cruikshank SJ, Connors BW. Infrabarrels are layer 6 circuit modules in the barrel cortex that link long-range inputs and outputs, *Cell Reports*, 21:3065–3078, 2017.

Goodwill HL, Manzano-Nieves G, LaChance P, Teramoto S, Lin S, Lopez C, Stevenson RJ, Theyel BB, Moore CI, Connors BW, Bath KG. Early Life Stress Drives Sex-Selective Impairment in Reversal Learning by Affecting Parvalbumin Interneurons in Orbitofrontal Cortex of Mice. *Cell Reports*. 25:2299-2307, 2018

REVIEWS, ESSAYS, AND BOOK CHAPTERS:

- Somjen G, Dingledine R, Connors B, Allen B. Extracellular potassium and calcium activities in the mammalian spinal cord and the effect of changing ion levels on mammalian neural tissues. In: *Ion Selective Microelectrodes and Their Use in Excitable Tissues*. E Sykova et al. (eds.), Plenum Press, pp. 159-180, 1981.
- Somjen G, Connors B, Kinnes C. Calcium activity and seizure mechanisms in the spinal cord of cats. In: *Physiology and Pharmacology of Epileptogenic Phenomena*. M Klee et al. (eds.), Raven Press, New York, pp. 309-318, 1982.
- Prince DA, Connors BW, Benardo LS. Mechanisms underlying interictal-ictal transitions. *Advances in Neurology, Vol. 34: Status Epilepticus*. AV Delgado-Escueta et al. (eds.), Raven Press, New York, pp. 179-189, 1982.
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- Prince DA, Connors BW. Mechanisms of epileptogenesis in cortical structures. *Ann. Neurol.* 16:S59-S64, 1984.
- Connors BW, Gutnick MJ. Cellular mechanisms of neocortical epileptogenesis in an acute experimental model. In: *Electrophysiology of Epilepsy* P Schwartzkroin, H Wheal (eds.), Academic Press, pp. 79-105, 1984.
- Ransom BR, Yamate CL, Connors BW. Developmental studies on brain extracellular space: Activity-dependent K⁺ accumulation and shrinkage. In: *Ion Measurements in Physiology and Medicine* M Kessler et al. (eds.), Springer-Verlag, Berlin, pp. 206-213, 1985.
- Prince DA, Connors BW. Mechanisms of interictal epileptogenesis. In: *Basic Mechanisms of the Epilepsies (Advances in Neurology, Vol. 44)* AV Delgado-Escueta et al. (eds.), Raven Press, New York, pp. 275-300, 1986.
- Ransom BR, Carlini WG, Connors BW. Brain extracellular space: Developmental studies in rat optic nerve. *Ann. New York Acad. Sci.*, 481: 87-105, 1986.
- Ransom BR, Connors BW. Electrophysiology of ependymal cells in the turtle cortex. In: *Functions of Neuroglia*, A Roitbak (ed.), Metsniereba, Teblisi, pp. 81-90, 1987.
- Connors BW, Gutnick MJ. Intrinsic firing patterns of diverse neocortical neurons. *Trends in Neurosciences*, 13: 99-104, 1990. (also reply to a letter to the editor; Connors, Gutnick, *Trends Neurosci.* 13: 365-366, 1990)
- Connors BW, Chagnac-Amitai Y. Synaptic inhibition, intrinsically bursting neurons, and synchronization in neocortex. *Exp. Brain Res. Ser. 20*, 11-15, 1991.
- Connors BW. GABA_A- and GABA_B-mediated processes in visual cortex. In: *Mechanisms of GABA in the Visual System*, RR Mize, R Marc, A Sillito (eds.), *Progress in Brain Res.*, pp. 335-348, 1992.
- Cauler LJ, Connors BW. Functions of very distal dendrites: Experimental and Computational studies of layer I inputs to layer V pyramidal neurons in neocortex. In: *Single Neuron Computation*, T McKenna, J Davis, SF Zornetzer (eds.), Academic Press, pp. 199-230, 1992.
- Silva LR, Connors BW. Synchronized oscillations intrinsic to the neocortex. In: *Epilepsy and Inhibition*, EJ Speckmann, MJ Gutnick (eds.), Urban & Schwarzenberg, Munich, pp. 215-227, 1992.
- Connors BW, Amitai Y. Generation of epileptiform discharge by local circuits of neocortex. In: *Epilepsy: Models, Mechanisms and Concepts*, PA Schwartzkroin (ed.), Cambridge University Press, pp. 388-423, 1993.
- Connors BW, Cauler LJ, Kim HG, Bühlhoff, I. Layer I and the excitable apical dendrite: Substrates for intracortical communication. In: *Structural and Functional Organization of the Neocortex*, B Albowitz et al. (eds.), Springer-Verlag, Berlin, pp. 173-180, 1994.

- Connors BW. Intrinsic neuronal physiology and the functions, dysfunctions and development of neocortex. *Progress Brain Res.*, 102: 195-203, 1994
- Amitai Y, Connors BW. Intrinsic physiology and morphology of single neurons in neocortex. In: *Cerebral Cortex, Vol. 11, The Barrel Cortex of Rodents*, E.G. Jones, I Diamond (eds.), Plenum Press, pp.299-331, 1995
- Connors BW, Amitai Y. Functions of local circuits in neocortex: synchrony and laminae. In: *The Cortical Neuron*, I Mody, MJ Gutnick (eds.), Cambridge Press, pp. 123-141, 1995.
- Connors BW, Castro-Alamancos MA, Beierlein M. Diverse neuronal functions of the cerebral cortex. In: *Excitatory Amino Acids and the Cerebral Cortex*, F Conti, TP Hicks (eds.), MIT Press, pp. 21-32, 1996.
- Connors BW, Regehr WG. Neuronal firing: Does function follow form? *Current Biology*, 6: 1560-1562, 1996.
- Connors BW, Amitai Y. Making waves in the neocortex. *Neuron*, 18: 347-349, 1997.
- Castro-Alamancos MA, Connors BW. Thalamocortical synapses. *Prog Neurobiol.* 51: 581-606, 1997.
- Connors BW. Anatomy and physiology of neocortex. In: *Epilepsy: A Comprehensive Textbook*, J Engel, TA Pedley (eds.), Lippincott-Raven Press, pp. 307-322, 1997.
- Connors BW, Landisman CE, Reid RC. Book review of *Thalamus. Volume I and II.* (M Steriade, EG Jones, DA McCormick; Elsevier, 1997), *Trends Neurosci*, 21: 539-540, 1998.
- Connors BW. Dendritic and synaptic variety in the neocortex. *Develop Neuropsychol*, 16: 311-313, 1999.
- Connors BW, Gil Z, Landisman CE, Gibson JR, Amitai Y. Pathway-specific regulation of synapses in the thalamocortical system. In: *Advances in Synaptic Plasticity*, Baudry M, Davis JL, Thompson RF (eds), MIT Press, pp. 198-219, 2000.
- Connors BW, Telfeian AE. Dynamic properties of cells, synapses, circuits and seizures in neocortex. In: *Neocortical Epilepsies*, Williamson PD et al. (eds), *Advances in Neurology*, 84:141-152, 2000.
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- Connors BW. Single neuron mnemonics. *Nature*, 420: 133-134, 2002.
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RESEARCH GRANTS:

Current:

NIH (NINDS), "Functions of electrical synapses in inhibitory networks". R01 NS-050434-08, 2/14-1/19, PI: Connors

NIH (NINDS), "Neocortical control of the thalamus". R01 NS-100016-01, 7/17-5/22, Multi-PIs: Connors and Cruikshank

NIH (NIMH), "Mechanisms driving sex differences in cognitive outcomes following early life stress". R01 MH115049, 8/18-4/23, PI: Kevin Bath, co-I: Connors,

Simons Foundation Autism Research Initiative (SFARI), "Disruptions of Cortical Function Due to Mutations of TSC1 and NHE6", 9/16-8/18, PI: Connors, co-PI: Theyel

NSF EPSCoR, RII Track-2 FEC; "Neural Basis of Attention", 9/16 – 8/20, Tse (PI), Connors (Co-I)

Recent grants to lab trainees:

Robin Chemers Neustein Graduate Fellowship in Brain Science, 2014-15, PI: Garrett Neske (Connors, mentor)

NIH (NINDS), predoctoral NRSA, "Functions of conditional Cx36-dependent electrical synapses in the neocortex", F31 NS083247-01, 3/13-2/16, PI: Arthur Sugden (Connors, mentor)

NSF Graduate Research Fellowship, 2014-17, PI: Rosa Martinez-Garcia (Connors, mentor)

NSF Graduate Research Fellowship, 2014-17, PI: Elizabeth McDonnell (Connors, mentor)

NIH (NINDS), postdoctoral NRSA, "Functions of naturally diverse inhibitory networks in neocortex", F32 NS084763-01, 7/13-6/16, PI: Shane Crandall (Connors, mentor)

NIH (NINDS), K99 Pathway to Independence award, "Dynamic properties of corticothalamic circuits", K99 NS096108-01, 4/16-3/18, PI: Shane Crandall (Connors, mentor)

Completed grants (recent):

NIH (NINDS), "Electrical synapses in the mammalian brain". R01 NS-050434-05, 1/05-12/10, PI: Connors

NIH (NINDS), "Cellular physiology of neuronal circuits in neocortex", R01 NS-025983-20, 4/06-4/11, PI: Connors

Brown University (OVPR Seed Grant), "The role of electrical coupling between mitral cells in olfactory coding"; co-PIs: Gilad Barnea, Barry Connors

NIMH, "Postdoctoral Training Program in Systems and Behavioral Neuroscience", T32 MH019118-19, 7/09-6/14, PI: Connors

NSF, "Integration of Dynamic Sensing and Actuating of Neural Microcircuits", EFRI-0937848, 2010-14; PI: Arto Nurmikko (Connors, co-PI)

NIH (NIMH), "Neurocircuitry Underlying DBS Effects in OCD: A Window into Mechanisms of Action", P50 MH086400-01, 9/09-8/14, PI: Haber (Connors, co-PI)

DARPA-BAA-09-27, "Brain Reorganization and Plasticity to Accelerate Injury Recovery (REPAIR): Multi-scale and Multi-modal Models Enabled by Next Generation Neurotechnology", 2010-15; PIs: Krishna Shenoy and Arto Nurmikko (Connors, co-PI)

New Frontiers Award, "Disruptions of Cortical Function Due to Thalamic Mutations in a Mouse Model of Autism", Brown Institute for Brain Science & Norman Prince Neuroscience Institute, 7/15-6/16. Co-PIs: Connors & Theyel

WM Keck Foundation Medical Research Grant Program, "Bioluminescent optogenetics to autoregulate excitable cells", 7/15-6/18, PI: Moore, co-PIs: Connors, Hochgeschwender, Kauer, Lipscombe